



Federal Communications Commission  
Authorization and Evaluation Division

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Re: FCC ID: QZC-MRX2EA4

Elster Solutions  
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The purpose of this letter is to request single modular approval of the Elster Solutions Energy Axis [www.elster.com](http://www.elster.com) Model MRX2EA4 printed circuit board assembly, which operates as a frequency-hopping spread-spectrum transceiver for automatic meter reading in the 902- 928 MHz ISM band under the provisions of FCC Part 15.247.

To address the specific numbered items of FCC Part 15.212:

1. The MRX2EA4 board incorporates two shields, one over the wireless transceiver IC and one over the RF front end module, both attached (soldered) to the printed-circuit board. The bottoms of the shields are enclosed by a copper plane that is part of the printed-circuit board.
2. The MRX2EA4 transmitter incorporates digital buffers on the data inputs, which are part of the transceiver ICs. The peak modulation is set by firmware that is stored within the transceiver ICs. The data rate is set by the same stored firmware. For this reason, over-driving the modulation input, or applying excessive data rates to the data input cannot produce over-modulation.
3. The MRX2EA4 has its own power supply regulation. It receives unregulated power from the host metering devices and this is applied to a switching regulator which is followed by a linear regulator to supply the lower voltage sections of the device. For this reason, varying the supply voltage to the MRX2EA4 cannot vary the transmitter power, which is set and measured at the time of manufacture.
4. The MRX2EA4 can be configured to use an internal or external antenna, both meeting FCC parts 15.203, 15.204(b), and 15.204(c). The internal antenna is fully integrated into the printed circuit board, being constructed of copper patterns etched in the board during its fabrication. External antennas are directly connected to an isolation board for safety, which in turn is directly connected to the MRX2EA4 module.
5. The MRX2EA4 module was tested in a stand-alone configuration for compliance with the FCC Part 15 requirements. The module also complies with the AC line conducted requirements found in FCC Part 15.207. The MRX2EA4 module is intended to be installed in an MREX2 enclosure along with 11 other MRX2EA4 modules.
6. The MRX2EA4 has a label to identify the module's FCC ID. This label is silkscreen printed on the MRX2EA4 printed circuit board assembly and is thus permanent. Additionally, the FCC ID appears on the front-panel nameplate of Elster Solutions meters and devices that contain the MRX2EA4 module.
7. The MRX2EA4 complies and is certified for compliance with all of the applicable provisions of FCC Part 15.247 for frequency-hopping spread-spectrum devices.
8. The MRX2EA4 is a low-power (0.25 W) device and operates with a low duty cycle. The MRX2EA4 has been demonstrated and certified to comply with the MPE RF exposure requirements for mobile devices. Installation and operating instructions specify the required minimum distance from humans for installed electricity meters.

Respectfully,

A handwritten signature in black ink that reads "John Holt".

John Holt  
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